dance at the spots where the currents tending to their formation must have prevailed as the land went down; in cols, then straits connecting opposite firths from which tides would flow in on either side; at the openings of mountain valleys, where the stream with its gravel burden was then met by the incoming tide; on low plateaus lying between what were then estuaries, over which opposing currents would sweep each high tide; and in other similar situations.

But were the Kames formed as the land sunk, or during its subsequent emergence? One would be inclined to say during the latter period, for any heaps piled up by the incoming sea would be liable to be swept away when they again became exposed to wave-action as the sea retreated. Nevertheless, Mr. Geikie—and he is supported by other observers in his opinion—holds that it was during the period of depression that kame-building went on, for the following reasons. The material of the Kames is, for the most part, fine and well rounded, and it is a very rare thing to find a large angular boulder in the heart of a Kame; hence it is believed that during the formation of the Kames the climate had so far mended that glaciers no longer existed, and that therefore there were no icebergs to strew the sea-bottom with travelled blocks. Erratics are, however, common perched on the outside of the Kames, and hence it is concluded that at some point in the period of the submergence cold again began to come on, that glaciers reappeared and gave rise to icebergs which bore away these blocks and dropped them where they are now found. That there was a return to cold conditions we know from other evidence, and with the exception of the difficulty just mentioned, which after all is not very serious, for the Kames we have may be only the relics of a body originally much more numerous, the explanation accords well enough with our knowledge of the facts. But the thought crosses the mind that it is not very often that we have an opportunity of seeing into a Kame, or rather, that we see the outside much oftener than the inside, and that this possibly may be the reason why erratics seem to be more plentiful in the one place than the other.

A. H. GREEN

(*To be continued.*)

OUR BOOK SHELF

Mineralogische Mittheilungen, 4th Heft. (Vienna, 1873.)

THE present number of the *Mineralogische Mittheilungen* forms the 4th volume of the series, commenced in 1870. It is published under the auspices of the K. K. Geol. Reichsanstalt, and in connection with their quarterly Jahrbuch, but forms properly in itself an independent journal. It is probably the only periodical devoted exclusively to mineralogy, and thus already occupies an important place among German scientific serials. The list of papers which appear in this number will give a good idea of the position which the journal occupies:—Mineralogical observations in the Argentine Republic, by H. Stelzner (embracing—minerals occurring in the granite quartz masses of Cordoba; minerals associated with the granular limestone; also analyses and special description of Triplite, Jamesonite, Enargite, Linarite, &c.); eruptive rocks of Banat, Hungary, by Niedzwiedzki; crystallised magnesite from the Northern Alps, by J. Rumpf; mineral observations from the Bohemian Forest, by Helmhacker; brief notices of various minerals, Grunochite, an optically uni-axial diamond, native copper, Roselite, &c. The number opens with a short obituary notice of Naumann.

The Mittheilungen are under the charge of Prof. Tschermak, so well known through the scientific world for his many and valuable contributions to mineralogy and lithology.

Prof. Tschermak occupies the position of Director of the Royal Mineralogical Museum of Vienna, a collection which in beauty and completeness is not inferior to that of the British Museum, while it surpasses the latter in the arrangement of the objects exhibited, especially in reference to the good of the general public. The Museum has been much enriched within the last four months by the acquisition of a number of interesting things from the Vienna Exposition. The collections are opened two mornings in the week, for the benefit of the public, opportunities which are well made use of, while the Cabinet is accessible on every week-day to those who are there engaged in regular work. The results accomplished in the Mineralogical School thus formed in connection with Prof. Tschermak and Dr. Schrauf do a considerable part toward supporting the *Mineralogische Mittheilungen.*

The Geological Reichsanstalt, now under the direction of Franz Ritter von Hauer, has carried on its work for twenty-seven years. The results are not only of the greatest importance in developing the resources of the Empire itself, but, as the work engages the best talent, and is consequently carried on according to the highest standard of pure science, the yearly labours are adding vastly to the fund of geological knowledge, and helping to solve many of the difficult problems of the science. The building occupied by the Reichsanstalt contains the various working-rooms, and the extensive collections, complete naturally in all matters pertaining to Austrian Zoology. The immediate results of the survey are first made known in the Evening Sessions, which are held on the first and third Tuesday of each month from November to May. They are attended regularly by some thirty or forty of those interested in such subjects, and form a pleasant opportunity for those of common interests to meet together informally. The stranger is continually impressed with the active spirit, and especially with the community of feeling, among the scientific men of Vienna; the latter has undoubtedy great influence in giving the city the prominent position which it occupies among the different scientific centres.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.*]

Zoological Nomenclature

FROM time to time an idea is started that Zoology is breaking down under the weight of its synonymy. With entomologists I have frequently contended that so far from this being the case, there is, on the contrary, an almost marvellous agreement in the generic and specific names used, especially when we consider the extent of the bibliography and the vast number of the species. After reading in NATURE, vol. ix. p. 258, Mr. Wallace's review of Dr. Sharp's pamphlet, I bethought myself of comparing the two best known catalogues of European Coleoptera, viz., Schaum's, published at Berlin, in 1862, and De Marseul's, at Paris, in 1866. Perhaps the results of the examination of the first six families in the two works will suffice. It must be premised that Schaum's is strictly confined to European species, while De Marseul's embraces as well those of the "basin of the Mediterranean in Asia and Africa." As to the genera, in the Cicindelidæ there are two in each. In the Carabidæ, Schaum has 98 genera and de Marseul 118; of the latter four are not adopted by Schaum and the remainder are extra-European. In the Dytiscidæ Schaum has 15 genera, De Marseul 17. In the Gyrinidæ there are two genera in Schaum, and three in De Marseul, the third being

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extra-European. Hydrophilidæ not having the same limitation in the two works, I take the Palpicorn families in which that group and the Sphæridiidæ are included. There are 22 genera in each catalogue, but Schaum and De Marseul each ignore a genus adopted by the other, and a third name, Cyllidium, is preferred by the French author to the earlier one of Chætarthria. As to the species, seeing that Schaum has about 1,580 in the families mentioned above, and De Marseul 2,640, it would not be easy to compare them in a definite form; but taking Cicindela, the second genus of the two catalogues, the first having only one species, which is, I conceive, a fair example of the others, if indeed it has not had more than its share of varieties elevated to the rank of species, we find the 26 species in Schaum identical in names with the same species in De Marseul, except two varieties or species, and a synonym given with a ? by Schaum, which is the right name according to De Marseul.

I would venture to suggest that the synonyms which look so formidable to some of our friends, are principally due to the writers of local faunas, or in some cases to specialists, and that such names have, as a rule, never been adopted, and practically offer no hindrance whatever to the naturalist. A species may be described by an author who is ignorant that it has been previously described, but this is an evil which it is sometimes impossible to avoid, as in the case of almost simultaneous publication; but in due time the later name is relegated to the list of synonyms and gives little further trouble. It does not seem to me that any change or additions to the present rules of nomenclature are needed. Naturalists very soon decide on the relative value of names, but always with due regard to the law of priority; it is a misfortune, perhaps, that this law is sometimes pushed too far, as in the case either of forgotten authors, or of doubtful descriptions. The alteration of trivial names from two authors using the same word is a case of very rare occurrence.

FRANCIS P. PASCOE

The so-called "Meteor-cloud" of Feb. 5

YOUR correspondent, Captain S. P. Oliver, appears to have been mistaken as to the character of the phenomenon seen by him on February 5, and noticed in NATURE (vol. ix. p. 313). At the hour he has indicated, the somewhat rare phenomenon an auroral arch was formed, which remained visible for about half an hour, and is doubtless the luminous "meteor cloud" seen by him. The description Captain Oliver has given of it is sufficiently accurate, though he does not mention that it drifted slowly southward, a well-known characteristic of the phenomenon. Its direction was of course at right angles to the magnetic meridian, and its position in the heavens, as seen from this locality, was more northward than that observed by your correspondent. During the whole time that I observed it, the arch crossed some portion of the constellation Ursa Major, the star δ Ursæ Majoris being in its midst when first seen, and the entire arch having retreated southward as far as ζ Ursæ Majoris before it disappeared. It was of uniform breadth and intensity, and spanned the sky from west to east (magnetic), passing not much to the north of the zenith. Although I have been fortunate enough to have seen auroral arches upon several occasions, and once succeeded in obtaining the spectrum, I have never seen a brighter or more complete arch than this one; but what made it quite unique, at least as far as my experience goes, was the fact that the ordinary aurora with a well-defined "dark segment" was visible in the north-north-west at the same time, from which, at an earlier period, brilliant streamers had proceeded. There were therefore two parallel arches of light at an interval of perhaps 50° from one another, which the slow movement of the upper one gradually increased. The night was remarkably clear, and the zodiacal light had been plainly visible earlier in the evening.

JOHN J. PLUMMER

The Observatory, Durham, Feb. 21

Aboriginal Australian Artists

I NOTICED, in one of your latest papers, that some of your readers doubted the ability of Australian, or other low savages, to sketch in the manner of the Vezère people, and I made a copy of a few sketches still found in this neighbourhood engraved on rocks. They consist chiefly of fishes, whales, birds, and a few men; the execution is not so good as when the figures are scratched on blackened bark. I also send you a photograph of a carving in fossil coral from New Guinea. H.M.S. *Basilisk* has not long ago returned from New Guinea, and brought some splendid weapons, &c.; also one of the Papuan pigs, which they brought for our collection. It is the most intelligent pig I have ever seen, follows me like a dog, and goes up to the very top of the Museum building, which is about 80 feet high.

I noticed the, to me, wonderful remark about a scarcity of skeletons of large carnivora in European museums, and I am glad to say that we possess two tigers, two lions, wolf, hyæna, three grey seals, two large sperm whales, 70 and 35 feet in length, many small birds, dugongs, &c. &c. The sum total of our skeletons, all mounted, is more than 150; with few exceptions all articulated on the premises by one man, who has never been out of Sydney in his life. If our Government grant some extra money for cabinets, I think we shall be able to astonish the people on board the *Challenger* when they come here, because half our Australian fossils and minerals cannot be exhibited for want of the necessary cases.

GERARD KREFFT

P.S. The trustees have had so many applications for *Ceratodus* specimens, and they have been so often disappointed when exchanging them with other museums, that they have now determined to sell their duplicates in London to the highest bidders. Five of these fishes, in spirits (males and females) will be despatched to Messrs. P. W. Flower and Sons, and I hope that a good price will be obtained for them. Up to the present time all efforts to obtain more of the *Ceratodus* have been in vain, and I believe that they are not so common as some people think. Mr. George Masters has too much to do here; and besides, we have no funds, travelling being very expensive in the Wide Bay district, otherwise another Expedition would be sent by the Board. Mr. Masters knows *how* to catch them, and I hope that when the *Challenger* arrives he will be able to accompany a party from that ship to Gayndah.

Rainbow and its Reflexion

A FEW weeks ago I had the pleasure of seeing a rainbow and its reflexion, or at least a reflexion of one from the same shower at the same time, in smooth water.

The base of the bow in the cloud seemed but a few hundred yards from me, and the reflexion evidently did not belong to it, as the two bases did not correspond, the reflected bow lying inside the other, the red of the one commencing where the violet rays of the other disappeared.

Balbriggan, Ireland, Feb. 2 GEORGE DAWSON

Remarkable Fossils

THE letter by Mr. T. W. Cowan in NATURE, vol. ix. p. 241, confirms the truth of the statements contained in my "Appeal to our Provincial Scientific Societies" which appeared in NATURE, vol. ix. p. 162. Collections of the kind described by Mr. Cowan are "kicking" about the country in all directions, valued merely as temporary possessions by the owners, few of whom, as far as my experience goes, appear to possess sufficient public spirit or intelligence to realise their public and scientific importance; otherwise these collections would be more frequently localised and preserved for the district museum.

Jan. 31 S. G. P.

Volcanoes and the Earth's Crust

MR. HOWORTH, in NATURE, vol. ix. p. 201, advances the following opinions:—That volcanoes are found neither in regions of elevation nor of subsidence, but on the boundaries between them; that the great continents are on the whole rising, and the beds of the great oceans on the whole sinking; and that the centres of elevation are in the circumpolar regions.

It seems to me that the last two statements cannot be reconciled with each other. The southern hemisphere is for by far the greater part oceanic. According to Mr. Howorth, the ocean-beds are subsiding, and yet the southern circumpolar region contains a focus of elevation. Further: if volcanoes are not found in areas of elevation, and if the circumpolar regions are regions of elevation, what does he make of the volcanoes of Jan Mayen (between Norway and Spitzbergen), and of the Antarctic continent?

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